

Guneet Singh Dhillon

Curriculum Vitae

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Education

- Aug 2014 - May 2018 **University of Texas at Austin**, Austin, TX
B.Sc. in Computer Science with Honors (Turing Scholars Honors)
B.Sc. in Mathematics with Honors **GPA: 3.89 / 4**
 - **Honors Thesis**: Training Ising Models on Images using Sparsitron (Advisor - Dr. Adam Klivans)
 - **Certificate** : Applied Statistical Modeling
 - **Minor** : Economics
 - **Programs** : Freshman Research Initiative, Directed Reading Program

Work Experience

- Dec 2019 - Current **Applied Scientist II**, *Amazon Web Services, Inc.*, Pasadena, CA
Jul 2018 - Dec 2019 **Applied Scientist I**, *Amazon Web Services, Inc.*, Pasadena, CA
 - Devised the algorithm *Transductive Fine-tuning* for few-shot image classification, with Dr. Stefano Soatto (ICLR 2020 publication)
 - Devised algorithms that are being used in the *Amazon Textract* product (link)
 - Key-value pair detection: question-answer pairs in forms (e.g. "name" – "Guneet")
 - Table detection: tables and corresponding table cells

May 2017 - Aug 2017 **Software Development Engineer Intern**, *Amazon Web Services, Inc.*, Palo Alto, CA
 - Devised the algorithm *Stochastic Activation Pruning* for robust image classification, with Dr. Anima Anandkumar (ICLR 2018 publication)
 - Implemented the algorithm from *Dense-Sparse-Dense Training for Deep Neural Networks* in MXNet

May 2016 - Aug 2016 **Machine Learning Intern**, *CognitiveScale Inc.*, Austin, TX
 - Used probabilistic non-negative matrix factorization and Gibbs sampling techniques to build a search and recommendation system, with Dr. Ayan Acharya

Jan 2016 - May 2016 **Undergraduate Learning Assistant**, *University of Texas at Austin*, Austin, TX
 - Held office hours for the course *Matrices and Matrix Calculations* taught by Dr. John Gilbert

May 2015 - Aug 2015 **Software Technology Engineering Intern**, *Dell Inc.*, Austin, TX
 - Implemented a Windows 10 Universal App. to connect and share features between multiple devices

Publications and Theses

- Dec 2019 **Guneet S. Dhillon**, Pratik Chaudhari, Avinash Ravichandran, Stefano Soatto. **A Baseline for Few-shot Image Classification**, (pdf). *In Proc. of the International Conference on Learning Representations (ICLR), 2020; Short version in Proc. of the Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS), 2019.*
- Mar 2018 **Guneet S. Dhillon**, Kamyar Azizzadenesheli, Zachary C. Lipton, Jeremy Bernstein, Jean Kossaifi, Aran Khanna, Anima Anandkumar. **Stochastic Activation Pruning for Robust Adversarial Defense**, (pdf). *In Proc. of the International Conference on Learning Representations (ICLR), 2018; Short version in Proc. of the Machine Deception Workshop, Conference on Neural Information Processing Systems (NeurIPS), 2017.*
- May 2018 **Guneet S. Dhillon**. **Training Ising Models on Images using Sparsitron**, (pdf). *Undergraduate Honors Thesis (Advisor: Dr. Adam Klivans), 2018.*

Research Projects

- Jan 2016 - Dec 2017 **Clustering and Prediction in Time-series Data**, with Dr. Sinead Williamson
Clustering time-series data and predicting future values by modeling the data using an infinite mixture of probabilistic auto-regressive models, learned using Gibbs sampling techniques
- Nov 2017 - Dec 2017 **Generative Adversarial Networks (GANs) for Adversarial Training**, (pdf), course project
Robust image classification using a generator-discriminator formulation to train deep learning models

Nov 2016 - Dec 2016	Conflict Graphs for Parallel Stochastic Gradient Descent , (pdf), course project Training SVMs by exploring conflict graphs to parallelize stochastic gradient descent training
Jan 2015 - May 2015	Genetic Algorithms for Efficient 3D Printing , course project Minimizing the overhang region in 3D printing using genetic algorithms to find optimal slicing planes
Apr 2015 - May 2015	Efficient Thread Scheduling , course project Reducing the wait-time for threads by scheduling them based on past CPU and I/O time

Honors and Awards

Aug 2017 - May 2018	Out-of-State Tuition Waiver, CNS, UT Austin
Aug 2017 - May 2018	Thomas and Elizabeth Merner Scholarship in Natural Sciences, CNS, UT Austin
Aug 2017 - May 2018	Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Dept. of CS, UT Austin
Apr 2018	College Scholar, CNS, UT Austin
Aug 2016 - May 2017	Motorola Endowed Scholarship, Dept. of CS, UT Austin
Apr 2017	College Scholar, CNS, UT Austin
Aug 2015 - May 2016	Angus G. and Erna Pearson Endowed Undergraduate Scholarship, Dept. of CS, UT Austin
Aug 2015 - May 2016	General Financial Aid Scholarship, International Student and Scholar Services, UT Austin
May 2015 - Aug 2015	TIDES FRI Summer Research Fellowship, CNS, UT Austin
Aug 2014 - May 2015	Freshman Scholarship, CNS, UT Austin
Aug 2014 - May 2015	Schein Memorial Scholarship, Dept. of CS, UT Austin

Coursework

Graduate Courses UT Austin, 2016-17	Convex Optimization (Constantine Caramanis), Numerical Analysis: Linear Algebra (George Biros), Linear Models (Peter Müller)
Undergraduate Courses UT Austin, 2014-18	Honors Statistics: Honors (James Scott), Intro to Data Mining (Adam Klivans), Randomized Algorithms (David Zuckerman), Geometric Foundations of Data Science (Chandrajit Bajaj), Intro to Stochastic Processes (Stephen Walker), Intro to Quantum Information Science (Scott Aaronson), Algorithms and Complexity: Honors (Eric Price), Artificial Intelligence: Honors (Peter Stone), Machine Learning / Vision: Honors (Kristen Grauman), Real Analysis I (Hector Lomeli), Differential Equations with Linear Algebra: Honors (Dan Knopf), Computational Intelligence in Game Research/Design I & II (Cem Tutum), Intro to Probability & Statistics (Sinead Williamson), Matrices and Matrix Calculations (John Gilbert), Introductory Game Theory (Dale Stahl), Financial Economics (Svetlana Boyarchenko), Microeconomic Theory (Gerald Oettinger), Principles of Computer Systems: Honors (Ahmed Gheith), Computer Organization & Architecture: Honors (Ahmed Gheith), Data Structures: Honors (Calvin Lin), Discrete Math for Computer Science: Honors (Isil Dillig)
Audited Courses Caltech, 2018-19	Linear Algebra and Convexity (Joel Tropp), Foundations of Machine Learning (Anima Anandkumar)

Talks and Presentations

A Baseline for Few-shot Image Classification

Dec 2019	Workshop on Meta-Learning, Conference on Neural Information Processing Systems (NeurIPS)
Jul 2019	Computer Vision Services / Systems in Amazon, Amazon Machine Learning Conference (AMLC)
Jul 2019	Data-Efficient Learning Techniques for Amazon Scale, Amazon Machine Learning Conference (AMLC)

Other Activities

Jan 2014 - May 2018	Member of the Sikh Student Association, UT Austin
Aug 2014 - May 2018	Member of the Turing Scholars Student Association, UT Austin
Aug 2016 - May 2017	School Relations Director for the Undergraduate Machine Learning Labs, UT Austin
Oct 2016	Participated in the Electronic Trading Challenge, UT Austin; Secured seventh position
Jan 2015 - May 2016	Member of the Texas Table Tennis Team, UT Austin; Secured an NCTTA Rank of 689
Feb 2016	Participated in the dataHACK, UT Austin; Secured fourth position and an honorable mention
Aug 2014 - Dec 2015	Member of the Longhorn Cricket Club Team, UT Austin